

# Characteristics and Production Costs of U.S. Corn Farms, 1991

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**In this report...** *The average variable cash cost of producing a bushel of corn was \$1.25 for producers surveyed in the 1991 Farm Costs and Returns Survey. Individual farm costs ranged from about \$0.40 to more than \$8 per bushel. Regional differences in production practices and growing conditions had the greatest influence on production costs. Corn growers in the North Central and Plains regions had a significant cost advantage over producers in the Northeast and Southeast. Dry weather reduced yield and resulted in abnormally high per-bushel costs in the Northeast. Nearly 70 percent of Northeast producers and more than half of Southeast producers were high-cost corn growers in 1991.*

Average U.S. crop acreage planted to corn declined by 6 percent between 1977-84 and 1985-92. The greatest reduction in planted corn acres occurred in the Southeast and Northeast where 25 and 13 percent fewer corn acres, respectively, were planted. Falling returns from corn relative to returns from competing crops, such as cotton in the South, dramatically reduced corn acreage (USDA, NASS, Jan. 1992). Despite lower relative returns, average corn acreage remained much the same in the major corn-producing areas between 1977-84 and 1985-92. North Central producers planted 6 percent fewer acres, while producers in the Plains increased average corn acreage by 5 percent. Higher yields and lower costs have made corn an important enterprise on North Central farms. Irrigated corn is an important enterprise on farms in the Plains States. Participation in the corn program has historically been much higher in the North Central and Plains regions than in the Southeast or Northeast. Planting requirements associated with Government program participation has kept corn acreage relatively steady in these regions.

This report compares selected farm characteristics and production costs among corn producers. Producers are grouped according to variable cash costs, enterprise sizes, and production regions (see Glossary). Data are obtained from the 1991 Farm Costs and Returns Survey (FCRS) of U.S. corn

farms. The FCRS uses a multiframe stratified sample in which each farm surveyed represents a number of similar farms. The 708 respondents to the corn version of the 1991 FCRS represented 423,405 farms and 71.5 million planted corn acres (94 percent of U.S. corn acreage; USDA, NASS, Jan. 1992). Corn growers in the Western States were not surveyed because of their minor share of corn production and limited survey funds.

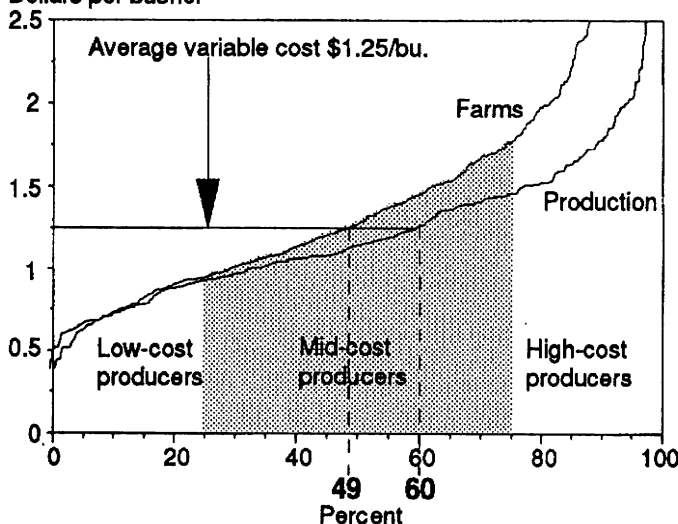
The average variable cash cost of producing corn on FCRS farms was \$137.87 per acre, or \$1.25 per bushel, in 1991. Estimated variable cash costs were converted to a per-bushel basis and ranked from lowest to highest to form a weighted cumulative distribution of farms and production (fig. 1). To analyze factors contributing to variations in production costs, corn farms were divided into low-, mid-, and high-cost groups (see Glossary).

Figure 1

## Cumulative distribution of variable cash production costs for corn, 1991

*About 49 percent of FCRS corn farms had variable costs at or below the average cost of \$1.25 per bushel, while 60 percent of the total corn harvest was produced at or below the average variable cost.*

Dollars per bushel



Source: 1991 Farm Costs and Returns Survey.

## Costs Varied Significantly Among Corn Producers

*Location, corn acreage, and corn yield distinguished low- from high-cost producers.*

Twenty-five percent of corn farms surveyed had variable cash costs per bushel of \$0.95 or less. These low-cost producers accounted for about 28 percent of total FCRS corn production (table 1). High-cost producers, with per-bushel variable cash costs of \$1.78 or more, accounted for only 10 percent of total production.

Differences in yields and per-acre costs determined whether producers were low- or high-cost. Dry weather in many areas resulted in reduced corn yields during 1991. Producers reported an expected yield of 131 bushels per acre, but achieved only 110 bushels. High-cost producers yielded an average of only 61 bushels of corn per acre, compared with an average of 125 bushels for low-cost producers (table 1)<sup>1</sup>. The difference between actual and expected yield indicates the extent to which uncontrollable factors, such as weather, affected yields. Actual yield was more than 50 bushels below that expected by high-cost producers, while actual and expected yield were similar on low-cost farms. However, the per-acre costs of each group suggest a significant cost advantage for low-cost producers. Average variable cash costs for high-cost producers were nearly \$50 per acre higher than that of the low-cost group (table 2). Average cost per bushel of expected yield was about \$0.50 higher for high-cost producers. Despite the poor yields experienced by many high-cost producers, greater per-acre costs and expected per-bushel costs suggest that many of these producers would be high-cost growers regardless of weather conditions.

Corn was a more important component of the overall farm business on low-cost operations than on high-cost operations. High-cost producers operated farms with more total acres, but low-cost producers planted more acres of corn. About 36 percent of operated acreage on low-cost farms was planted to corn, compared with only 18 percent on high-cost farms. Greater emphasis on corn production by low-cost producers is also illustrated by higher participation rates in the Government program for corn. About 74 percent of low-cost producers participated in the corn program, compared with only 51 percent of high-cost producers.

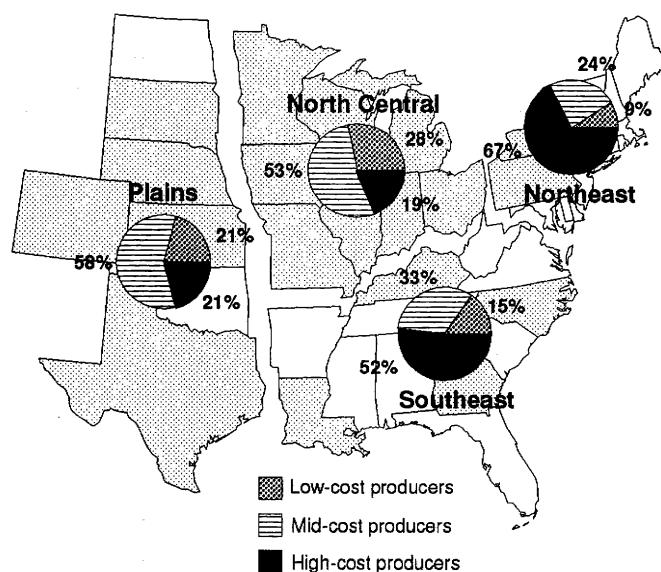
<sup>1</sup>Group means and percents presented in this report were statistically tested for significant differences. The discussions emphasize comparisons among groups only when means were significantly different at the 95-percent level (see Appendix 3).

Nearly 70 percent of Northeast and more than 50 percent of Southeast corn producers were in the high-cost group (fig. 2). Only 9 percent of Northeast growers were low-cost growers. The distribution of cost groups in each region is closely related to yields. Historically, North Central producers have had a yield advantage over other areas, particularly the South, while irrigation boosts yields in the Plains.

Total variable cash costs were nearly \$50 per acre lower for low-cost producers, with about \$25 of the difference due to lower fertilizer costs and \$10 in lower chemical costs (table 2). Fertilizer use was much the same for producers in the low- and high-cost groups. However, the high-cost group included many growers in Southern States where nitrogen fertilizer prices were higher than in other corn-producing areas (USDA, NASS, June 1992). Low- and high-cost producers applied similar amounts of herbicides, but high-cost producers used more insecticides. More high- than low-cost producers planted corn after corn and thus required insecticide for rootworm control. Also, more high- than low-cost producers had a major occupation other than farming and may have hired more labor to meet the seasonal demands of planting and harvesting.

Figure 2  
**Distribution of cost groups by region, 1991**

*A majority of Northeast and Southeast producers were in the high-cost group.*



Source: 1991 Farm Costs and Returns Survey.

**Table 1--Characteristics of FCRS corn farms, by variable cost group, 1991**  
*Differences in yield, size, and cropping practices distinguished low- from high-cost producers.*

Item	Unit	Cost group			All FCRS farms
		Low-cost producers	Mid-cost producers	High-cost producers	
Share of FCRS:					
Corn farms	percent	25	50	25	100
Corn production	percent	28	62	10	100
Corn yield	actual bu/acre	125	120	61	110
Corn yield	expected bu/acre	128	137	116	131
Size:					
Total operated acreage	acres	447	665	692	517
Planted corn acreage	acres	162	187	122	165
Harvested for grain	percent of acreage	98	97	85	95
Harvested for forage	percent of acreage	2	2	13	4
Previous crop on corn acres: <sup>1</sup>					
Corn	percent of farms	22	43	44	38
Soybeans	percent of farms	57	41	32	43
Corn program participation	percent of farms	74	67	51	65
Corn base	acres	141	174	97	147
Fertilizer use:					
Nitrogen	lbs/acre	123	131	104	124
Phosphorus	lbs/acre	47	52	55	51
Potassium	lbs/acre	50	57	67	57
Chemical use:					
Herbicide	acre-treatments	1.36	1.39	1.25	1.35
Insecticide	acre-treatments	0.14	0.44	0.23	0.33

<sup>1</sup>Data may not sum due to rounding or omission of possible categories.

**Table 2--Corn variable cash production costs and returns per acre, by variable cost group, 1991**  
*High-cost producers spent an average of nearly \$50 more per acre than low-cost producers, with more than \$30 of the difference in fertilizer and chemical costs.*

Item	Cost group			All FCRS farms
	Low-cost producers	Mid-cost producers	High-cost producers	
<i>Dollars</i>				
Costs per bushel:				
Variable costs, actual yield	0.77	1.28	2.38	1.25
Variable costs, expected yield	0.76	1.12	1.25	1.05
Costs and returns per acre:				
Value of production	285.09	276.96	146.60	254.84
Total variable costs	96.76	153.39	144.86	137.87
Seed	20.08	22.52	20.83	21.61
Fertilizer	29.14	48.29	53.75	44.59
Chemicals	16.91	23.67	26.11	22.46
Custom operations	3.74	8.04	7.15	6.82
Fuel, lube, and electricity				
Machine & vehicle	8.08	10.14	9.57	9.53
Irrigation	0.84	10.95	1.71	6.75
Drying	2.36	3.08	1.69	2.65
Repairs	11.35	14.49	12.32	13.31
Hired labor	2.43	8.41	10.77	7.37
Purchased irrigation water	0.07	0.59	0.31	0.41
Technical services	0.15	1.05	0.12	0.66
Commercial drying	1.64	2.17	0.52	1.73
Returns above variable costs	188.33	123.57	1.74	116.97

<sup>1</sup>Value of production determined from the yield reported in the FCRS and State-level corn harvest-month prices.

## Farm Characteristics and Production Costs Varied by Acreage of Corn

*Per-acre variable cash production costs increased with farm size, but per-bushel costs were lowest for producers planting 200-399 acres of corn.*

More than 70 percent of FCRS farms had fewer than 200 acres of corn and accounted for only about one-fourth of total production. The 10 percent of farms with 400 or more corn acres accounted for about 39 percent of the 1991 corn crop (table 3).

Acreage of corn planted was related closely to size of the farming operation. Farms in the smallest size group averaged 25 acres of corn as part of 264 operated acres, while the largest group averaged 633 acres of corn on 1,799 operated acres (table 3). Sixty-four percent of farms with fewer than 50 corn acres had sales less than \$40,000. In contrast, 72 percent of farms with more than 400 corn acres had \$500,000 or more in farm sales. Corn accounted for only 9 percent of farm acreage and 3 percent of total value of production on farms with fewer than 50 corn acres, compared with 35 percent of operated acreage and 27 percent of value of production on farms with 400 or more corn acres.

Many Southeast and Northeast corn growers were in the smallest size group (fig. 3). Sixty-three percent of Southeast producers and 46 percent of producers in the Northeast planted fewer than 50 acres of corn. The largest percentage of North Central and Plains growers planted 50-199 corn acres. Corn producers were generally larger in the Plains States than in the other regions. More than 45 percent of growers in the Plains States planted 200 or more corn acres, with 22 percent planting more than 400 acres, highest among the regions.

A majority of the smallest farms reported livestock as their production specialty (61 percent), while cash grains was the most common production specialty on the largest farms (72 percent). Among livestock enterprises, 34 percent of the smallest farms reported a dairy inventory, compared with only 9 percent of the largest farms. Poultry, sheep, and other livestock were also more common on the smallest farms. More than 60 percent of the corn produced on the smallest farms was used on the farm as livestock feed.

Larger farms more often participated in the Government program for corn than did smaller farms. Only 29 percent of producers with fewer than 50 corn acres were program participants, compared with 96 percent participation among growers with 400 or more corn acres. Several of the largest corn

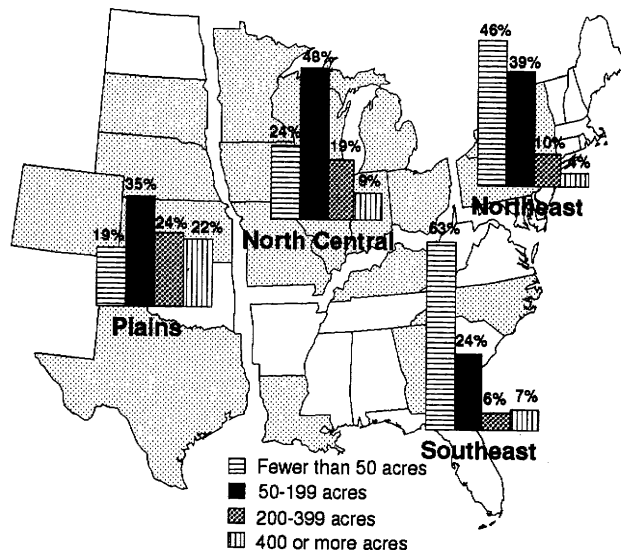
operations were located in the Plains, where Government program payments helped to offset the costs of irrigation. Many of the smallest corn farmers may have chosen not to participate in the corn program due to the need to harvest corn as silage, rather than grain, for dairy feed.

Per-acre variable cash production costs increased with farm size. The smallest farms spent \$116.94 per acre, compared with \$151.93 for the largest farms (table 4). Fuel and hired labor costs were highest on the largest farms primarily due to more irrigated corn acreage (29 percent of acreage). Lower costs on the smaller farms were spread over several input categories. Smaller farms seeded at a lower rate and applied less fertilizer and chemicals. However, yields on farms in each size group reflected the levels of input use. At 76 bushels per acre, yield on the smallest farms was 42 bushels less than on the largest farms (table 3). Despite lower per-acre costs, lower yields of producers in the smallest size group caused per-bushel costs to be the highest. Among all groups, variable cash production cost per bushel, at \$1.15, was lowest for producers planting 200-399 acres of corn.

Figure 3

### Distribution of size groups by region, 1991

*Sixty-three percent of corn producers in the Southeast and 46 percent of producers in the Northeast planted fewer than 50 acres of corn.*



Source: 1991 Farm Costs and Returns Survey.

**Table 3--Characteristics of FCRS corn farms, by enterprise size, 1991**

*Only 10 percent of farms had 400 or more corn acres, but accounted for 39 percent of total production.*

Item	Unit	Enterprise size (acres)				All FCRS farms
		Fewer than 50	50-199	200-399	400 or more	
Share of FCRS:						
Corn farms	percent	28	44	18	10	100
Corn production	percent	3	24	30	39	100
Corn yield	actual bu/ac	76	98	116	118	110
Corn yield	expected bu/ac	108	125	133	135	131
Size:						
Total operated acreage	acres	264	407	860	1,799	599
Planted corn acreage	acres	25	99	274	633	170
Harvested for grain	percent of acreage	87	93	96	97	95
Harvested for forage	percent of acreage	11	6	4	2	4
Corn production value	dollars	1,943	11,188	65,133	148,155	34,832
Farm production value	dollars	70,879	88,609	235,558	549,601	158,176
Corn program participation	percent of farms	29	71	84	96	65
Corn base	acres	14	83	253	582	147
Livestock inventory:						
Beef cattle	percent of farms	49	50	44	43	48
Dairy cattle	percent of farms	34	23	15	9	23
Hogs	percent of farms	24	30	30	31	29
Corn for farm use	percent of production	62	32	16	16	21
Corn production practices:						
Irrigated	percent of acreage	3	6	15	29	18
Dryland	percent of acreage	97	94	85	71	82

**Table 4--Corn variable cash production costs and returns per acre, by enterprise size, 1991**

*Per-acre variable cash costs increased with farm size, but lower yields on the smaller farms resulted in higher per-bushel costs.*

Item	Enterprise size (acres)				All FCRS farms
	Fewer than 50	50-199	200-399	400 or more	
<i>Dollars</i>					
Costs per bushel:					
Variable costs, actual yield	1.53	1.28	1.15	1.29	1.25
Variable costs, expected yield	1.09	1.00	1.01	1.12	1.05
Costs and returns per acre:					
Value of production	178.26	223.21	268.09	274.59	254.84
Total variable costs	116.94	124.92	133.78	151.93	137.87
Seed	18.67	21.95	21.61	21.68	21.61
Fertilizer	43.07	40.98	44.02	47.71	44.59
Chemicals	17.69	22.70	24.60	21.11	22.46
Custom operations	7.82	8.54	4.90	7.02	6.82
Fuel, lube, and electricity					
Machine & vehicle	11.22	9.53	9.67	9.23	9.53
Irrigation	0.60	2.04	5.24	11.87	6.75
Drying	0.82	1.99	2.71	3.24	2.65
Repairs	11.20	11.55	13.70	14.46	13.31
Hired labor	4.46	4.06	4.93	11.92	7.37
Purchased irrigation water	0.04	0.28	0.44	0.52	0.41
Technical services	0.05	0.23	0.81	0.90	0.66
Commercial drying	1.29	1.08	1.69	2.27	1.73
Returns above variable cost	61.32	98.28	133.78	122.66	116.97

<sup>1</sup>Value of production determined from the yield reported in the FCRS and State-level corn harvest-month prices.

## Regional Factors Influenced Corn Production Costs

*Differences in yield, acreage, and production practices contributed to regional variations in corn production costs.*

Seventy percent of FCRS corn farms were located in the North Central region and accounted for 67 percent of production (table 5). About 16 percent of farms were in the Plains, and accounted for more than one-fourth of production. The Southeast and Northeast regions together accounted for less than 15 percent of corn farms and only 6 percent of production.

Corn growers in the North Central and Plains States had a significant cost advantage over producers in the Southeast and Northeast (fig. 4). More than 80 percent of North Central and Plains corn growers had variable cash costs less than \$2 per bushel, compared with only 67 percent in the Southeast and 48 percent in the Northeast. Per-bushel costs were highest in the Northeast, where only 55 percent of producers had variable costs below \$2.50 per bushel and only 65 percent under \$3 per bushel. Nearly 90 percent of producers in the North Central and Plains had per-bushel variable costs below \$2.50. With corn prices averaging \$2.25-\$2.40 during 1991, many more North Central and Plains corn producers were able to cover variable cash costs than were producers in the other regions.

Corn yields were near those expected by growers in the Plains and Southeast. However, dry weather in the Northeast and eastern areas of the North Central resulted in yields that were much less than expected. The corn yield of 108 bushels per acre in the North Central was well below the 132 bushels farmers expected (table 5). Corn yield in the Northeast, at 61 bushels per acre, was less than half the expected yield. With relatively low per-acre costs, low yields inflated per-bushel costs for producers in the North Central and Northeast. If expected conditions had prevailed, the per-bushel cost of production would have been much lower in these regions than in the Southeast or Plains.

Farmers were asked to report cost of production information on corn acres that were planted with the intention of harvesting the corn for grain (see Glossary). On acreage that was not harvested, costs were reported up until the decision was made to abandon the crop for grain. Nearly one-third of the corn grain acreage in the Northeast was abandoned for grain and harvested as silage. The majority of corn producers in the Northeast reported an inventory of dairy cattle (73 percent). Faced with

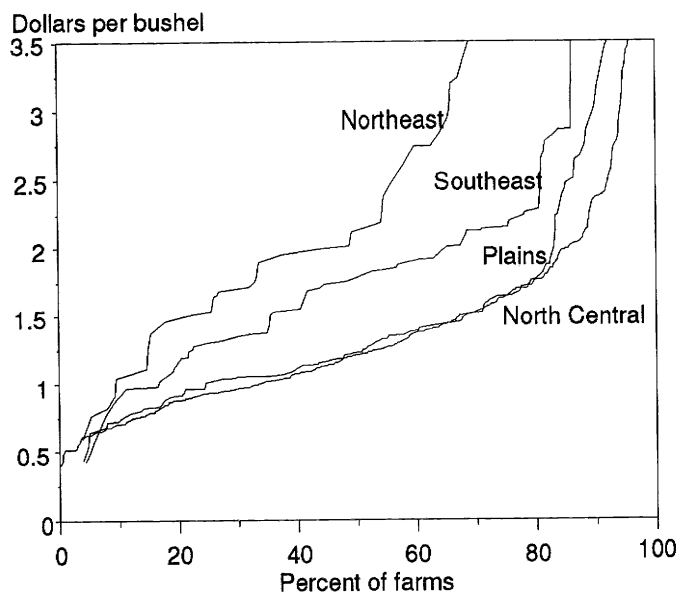
poor weather conditions for corn grain development, many Northeast producers likely opted to harvest the corn as silage for dairy feed. The result was to significantly raise the per-bushel cost of corn grain production in the Northeast.

Relatively high per-acre costs in the Plains States resulted from substantial use of irrigation. Nearly 70 percent of corn acreage in the Plains States was irrigated, with a regional average fuel cost of about \$28 per acre for irrigation (table 6). Per-bushel production costs in the Plains States were similar to those in the North Central during 1991 because of high yields on irrigated corn acreage. During normal growing conditions, however, producers in the North Central appear to have a clear cost advantage over Plains producers. Southeast producers appear to be at a cost disadvantage relative to the other regions. Relatively high per-acre costs for fertilizer, chemicals, and hired labor in the Southeast are not offset by greater yields.

Figure 4

### Regional cumulative distributions of corn variable cash production costs, 1991

*More than 80 percent of North Central and Plains corn producers had variable cash costs less than \$2 per bushel, compared with 67 percent in the Southeast and 48 percent in the Northeast.*



Source: 1991 Farm Costs and Returns Survey.

**Table 5--Characteristics of FCRS corn farms, by region, 1991**

*The North Central region accounted for 70 percent of FCRS corn farms and produced two-thirds of the total corn crop.*

Item	Unit	Region				All FCRS farms
		North Central	Plains	Southeast	Northeast	
Share of FCRS:						
Corn farms	percent	70	16	8	6	100
Corn production	percent	67	27	4	2	100
Corn yield	actual bu/acre	108	128	89	61	110
Corn yield	expected bu/ac	132	132	103	127	131
Size:						
Total operated acreage	acres	441	1,351	840	408	517
Planted corn acreage	acres	162	241	93	92	165
Harvested for grain	percent of acreage	96	96	98	68	95
Harvested for forage	percent of acreage	3	3	1	32	4
Livestock inventory:						
Beef cattle	percent of farms	41	69	62	51	48
Dairy cattle	percent of farms	24	6	8	73	23
Hogs	percent of farms	31	22	29	23	29
Corn for farm use	percent of production	23	14	24	67	21
Corn production practices:						
Irrigated	percent of acreage	2	68	3	0	18
Dryland	percent of acreage	98	32	97	100	82
Crop rotation on corn acres: <sup>1</sup>						
Corn-Corn	percent of farms	23	42	29	54	28
Corn-Soybeans	percent of farms	44	15	23	5	35

<sup>1</sup>Data may not sum due to rounding or omission of possible categories.

**Table 6--Corn variable cash production costs and returns per acre, by region, 1991**

*Poor yields in the North Central and Northeast resulted in abnormally high per-bushel costs.*

Item	Region				All FCRS farms
	North Central	Plains	Southeast	Northeast	
<i>Dollars</i>					
Costs per bushel:					
Variable costs, actual yield	1.19	1.27	1.69	2.12	1.25
Variable costs, expected yield	0.98	1.23	1.47	1.02	1.05
Costs and returns per acre:					
Value of production	247.72	296.12	224.06	156.53	254.84
Total variable costs	129.15	162.28	150.58	129.85	137.87
Seed	21.42	22.81	18.74	21.15	21.61
Fertilizer	45.26	40.71	55.73	41.77	44.59
Chemicals	22.94	20.63	25.04	21.59	22.46
Custom operations	6.67	7.64	3.53	8.86	6.82
Fuel, lube, and electricity					
Machine & vehicle	8.89	10.78	11.36	11.37	9.53
Irrigation	0.41	27.84	0.15	0.00	6.75
Drying	3.28	0.86	3.17	1.13	2.65
Repairs	12.15	16.52	16.17	10.90	13.31
Hired labor	5.99	8.85	16.47	12.83	7.37
Purchased irrigation water	0.00	1.76	0.00	0.00	0.41
Technical services	0.32	1.84	0.00	0.16	0.66
Commercial drying	1.81	2.03	0.24	0.09	1.73
Returns above variable costs	118.57	133.84	73.47	26.68	116.97

<sup>1</sup>Value of production determined from the yield reported in the FCRS and State-level corn harvest-month prices.

# Glossary

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**Corn farms** represent those selected in the 1991 Farm Costs and Returns Survey, Corn Cost of Production version. Corn farms are defined as farm operations that planted corn in 1991 with the intent of harvesting the corn for grain.

**Corn production regions** are groups of States with common cultural practices in raising corn. The North Central includes IL, IN, IA, MI, MN, MO, OH, and WI; the Plains includes KS, NE, SD, and TX; the Southeast includes GA, KY, LA, and NC; and the Northeast includes NY and PA.

**Variable cash costs** represent the costs for purchased inputs that are consumed in one production period. Variable costs depend on the chosen production practices, input quantities, and input prices.

**Low-cost producers** are the 25 percent of U.S. corn producers with the lowest per-bushel total variable cash costs. Those producers had variable cash costs per bushel of \$0.95 or less.

**High-cost producers** are the 25 percent of U.S. corn producers with the highest per-bushel total variable cash costs. Those producers had variable cash costs per bushel of \$1.78 or more.

**Enterprise size** categories are specified as farms with fewer than 50 corn acres, 50-199 corn acres, 200-399 corn acres, and 400 or more corn acres.

**Production specialty** is the farm production classification that represents the largest portion of gross commodity receipts from the farm operation.

**Value of production** is an estimate of the total value of all farm products produced on a farm, excluding the value of intermediate products such as corn fed to livestock.

**Financial position** describes the financial health of a farm business from a combination of income (net farm income) and solvency (debt/asset ratio) measures. Farms are categorized into one of four classes:

- **Favorable**--positive income and debt/asset ratio less than 0.40. These farms are generally considered financially stable.
- **Marginal income**--negative income and a debt/asset ratio less than 0.40. Periods of negative income may not pose financial difficulties if these farms are carrying a low debt load and can either borrow against equity or obtain income from off-farm sources.
- **Marginal solvency**--positive income and a debt/asset ratio above 0.40. A high debt/asset ratio may be acceptable if these farms can generate enough income to service their debt and meet other financial obligations.
- **Vulnerable**--negative income and a debt/asset ratio above 0.40. These farms are generally considered financially unstable.

**Economic class** is an economic classification of farm size. The classification is based on the gross receipts, including gross annual sales of crops; livestock, poultry, and products; miscellaneous agricultural products; and all Government payments of the farm operation.

**Expected yield** is the corn yield per acre farmers reported that they expected on their operation at the beginning of the growing season.

**Conservation tillage** farms are those that had an estimate of 30 percent or more of the previous crop residue covering the soil when corn was planted (McBride, 1992).

**Conventional tillage** farms are those that had an estimate of less than 30 percent of the previous crop residue covering the soil when corn was planted (McBride, 1992).

**Crop rotation** refers to the crops planted in 1989 and 1990 on the acres planted to corn in 1991.

## References

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McBride, W. "Conventional and Conservation Tillage Systems in Soybean Production, 1990," *Oil Crops Situation and Outlook Report*. OCS-33. U.S. Dept. Agr., Econ. Res. Serv., Apr. 1992, pp.15-20.

Salassi, M., M. Ahearn, M. Ali, and R. Dismukes. *Effects of Government Programs on Rice Production Costs and Returns, 1988*. AIB-597. U.S. Dept. Agr., Econ. Res. Serv., Mar. 1990.

U.S. Department of Agriculture, Economic Research Service. *Economic Indicators of the Farm Sector: Costs of Production--Major Field Crops, 1990*. ECIFS 10-3. July 1992.

U.S. Department of Agriculture, Economic Research Service. *Major Statistical Series of the U.S. Department of Agriculture: Costs of Production*. AH-671, Vol. 12, Mar. 1992.

U.S. Department of Agriculture, National Agricultural Statistics Service. *Crop Production: 1991 Summary*. Jan. 1992.

U.S. Department of Agriculture, National Agricultural Statistics Service. *Agricultural Prices: 1991 Summary*. June 1992.

**Appendix table 1--Characteristics of FCRS corn farms, by cost group, 1991**

Item	Unit	Cost group			All FCRS farms
		Low-cost producers	Mid-cost producers	High-cost producers	
Share of FCRS:					
Corn farms	percent	25	50	25	100
Corn production	percent	28	62	10	100
Corn yield	actual bu/acre	125	120	61	110
Corn yield	expected bu/acre	128	137	116	131
Size:					
Total operated acreage	acres	447	665	692	617
Planted corn acreage	acres	162	187	122	165
Harvested for grain	percent of acreage	98	97	85	95
Harvested for forage	percent of acreage	2	2	13	4
Sales class <sup>1</sup> :					
\$0-\$39,999	percent of farms	26	23	38	28
\$40,000-\$99,999	percent of farms	24	31	20	27
\$100,000-\$499,999	percent of farms	41	29	24	31
\$500,000 or more	percent of farms	9	17	17	15
Corn production value	dollars	37,752	44,289	12,853	34,832
Farm production value	dollars	133,467	177,819	143,438	158,176
Corn acreage tenure: <sup>1</sup>					
Owned	percent of acreage	40	39	50	41
Cash-rented	percent of acreage	20	36	26	30
Share-rented	percent of acreage	40	25	22	28
Previous crop on corn acres: <sup>1</sup>					
Corn	percent of farms	22	43	44	38
Soybeans	percent of farms	57	41	32	43
Wheat	percent of farms	d	3	8	4
Corn program participation	percent of farms	74	67	51	65
Corn base	acres	141	174	97	147
Production specialty: <sup>1</sup>					
Cash grains	percent of farms	48	52	35	48
Other crops	percent of farms	7	2	8	5
Livestock	percent of farms	46	42	57	47
Livestock inventory:					
Beef cattle	percent of farms	50	45	51	48
Dairy cattle	percent of farms	19	21	32	23
Hogs	percent of farms	29	32	22	29
Other livestock	percent of farms	16	15	24	18
Corn for farm use	percent of production	23	19	32	21
Financial position: <sup>1</sup>					
Favorable	percent of farms	74	58	61	63
Marginal income	percent of farms	17	21	28	22
Marginal solvency	percent of farms	6	12	4	9
Vulnerable	percent of farms	3	8	7	7
Major occupation:					
Farming	percent of farms	94	86	86	88
Other	percent of farms	6	14	14	12
Operator age:					
Fewer than 50 years	percent of farms	60	45	40	48
50 years or more	percent of farms	40	55	60	52
Operator education: <sup>1</sup>					
High school or less	percent of farms	69	64	72	67
Completed college	percent of farms	12	18	11	15

<sup>1</sup>Data may not sum due to rounding or omission of possible categories.  
d = insufficient data for disclosure.

**Appendix table 2--Practices and input use of FCRS corn farms, by cost group, 1991**

Item	Unit	Cost group			All FCRS farms
		Low-cost producers	Mid-cost producers	High-cost producers	
Corn production practices:					
Irrigated	percent of acreage	5	27	5	18
Dryland	percent of acreage	95	73	95	82
Crop rotation on corn acres: <sup>1</sup>					
Corn-corn	percent of farms	16	31	35	28
Corn-soybeans	percent of farms	49	35	23	35
Corn-other	percent of farms	9	4	5	6
Soybeans-corn	percent of farms	d	4	d	3
Soybeans-soybeans	percent of farms	8	3	8	6
Soybeans-other	percent of farms	d	1	6	2
Other-corn	percent of farms	6	9	7	8
Other-soybeans	percent of farms	d	2	d	1
Other-other	percent of farms	11	11	13	12
Seed:					
Rate, total <sup>2</sup>	seeds/acre	24,917	26,076	24,707	25,537
Rate, one time	seeds/acre	24,801	25,926	24,020	25,291
Acres reseeded	percent of acres	d	d	3	1
Fertilizer use:					
Any fertilizer	percent of farms	93	99	98	97
Nitrogen	percent of farms	91	98	97	96
Phosphorus	percent of farms	79	91	93	88
Potassium	percent of farms	77	80	87	81
Manure	percent of farms	33	30	29	30
Fertilizer use:					
Nitrogen	lbs/acre	123	131	104	124
Phosphorus	lbs/acre	47	52	55	51
Potassium	lbs/acre	50	57	67	57
Manure	tons/acre	1	1	2	1
Chemical use:					
Any chemicals	percent of farms	91	97	93	95
Herbicides	percent of farms	89	94	89	92
Insecticides	percent of farms	20	32	23	27
Herbicide	acre-treatments	1.36	1.39	1.25	1.35
Insecticide	acre-treatments	0.14	0.44	0.23	0.33
Tillage system use:					
Conventional	percent of farms	74	77	75	75
Conservation	percent of farms	26	23	25	25
Tillage and planting	field passes	3.13	3.37	3.51	3.34
Tillage and planting	hours/acre	0.62	0.72	0.76	0.71
Soil surface covered	percent	22	20	18	20
Custom operations use:					
Any custom operations	percent of farms	61	72	67	68
Land prep/cultivation	percent of farms	d	7	2	4
Planting	percent of farms	d	7	4	4
Fert/chem application	percent of farms	57	68	60	63
Harvesting	percent of farms	13	25	20	20
Drying use:					
Bushels dried	percent of production	51	57	39	53
Bushels commercially dried	percent of production	12	20	6	16
Bushels farm dried	percent of production	39	37	34	37
Moisture removed	percentage points	2.78	2.63	1.11	2.29

<sup>1</sup>Data may not sum due to rounding.

<sup>2</sup>Total seeding rate includes reseeding.

d = insufficient data for disclosure.

**Appendix table 3--Characteristics of FCRS corn farms, by enterprise size, 1991**

Item	Unit	Enterprise size (acres)				All FCRS farms
		Fewer than 50	50-199	200-399	400 or more	
Share of FCRS:						
Corn farms	percent	28	44	18	10	100
Corn production	percent	3	24	30	39	100
Corn yield	actual bu/ac	76	98	116	118	110
Corn yield	expected bu/ac	108	125	133	135	131
Size:						
Total operated acreage	acres	264	407	860	1,799	599
Planted corn acreage	acres	25	99	274	633	170
Harvested for grain	percent of acreage	87	93	96	97	95
Harvested for forage	percent of acreage	11	6	4	2	4
Sales class <sup>1</sup> :						
\$0-\$39,999	percent of farms	64	23	0	0	28
\$40,000-\$99,999	percent of farms	24	41	9	d	27
\$100,000-\$499,999	percent of farms	9	31	66	28	31
\$500,000 or more	percent of farms	3	5	24	72	15
Corn production value	dollars	1,943	16,188	65,133	148,155	34,832
Farm production value	dollars	70,879	88,609	235,558	549,601	158,176
Corn acreage tenure: <sup>1</sup>						
Owned	percent of acreage	78	48	35	37	41
Cash-rented	percent of acreage	14	28	28	35	30
Share-rented	percent of acreage	7	23	37	27	28
Previous crop on corn acres: <sup>1</sup>						
Corn	percent of farms	51	34	30	38	38
Soybeans	percent of farms	22	45	66	47	43
Wheat	percent of farms	4	5	1	9	4
Corn program participation	percent of farms	29	71	84	96	65
Corn base	acres	14	83	253	582	147
Production specialty: <sup>1</sup>						
Cash grains	percent of farms	28	51	61	72	48
Other crops	percent of farms	11	1	6	1	5
Livestock	percent of farms	61	48	33	28	47
Livestock inventory:						
Beef cattle	percent of farms	49	50	44	43	48
Dairy cattle	percent of farms	34	23	15	9	23
Hogs	percent of farms	24	30	30	31	29
Other livestock	percent of farms	33	10	12	19	18
Corn for farm use	percent of production	62	32	16	16	21
Financial position: <sup>1</sup>						
Favorable	percent of farms	60	66	64	55	63
Marginal income	percent of farms	32	20	16	11	22
Marginal solvency	percent of farms	3	6	13	26	9
Vulnerable	percent of farms	5	7	7	7	7
Major occupation:						
Farming	percent of farms	79	88	100	95	88
Other	percent of farms	21	12	d	5	12
Operator age:						
Fewer than 50 years	percent of farms	34	53	52	52	48
50 years or more	percent of farms	66	47	48	48	52
Operator education: <sup>1</sup>						
High school or less	percent of farms	75	71	54	53	67
Completed college	percent of farms	15	11	15	28	15

<sup>1</sup>Data may not sum due to rounding or omission of possible categories.  
d = insufficient data for disclosure.

**Appendix table 4--Practices and input use of FCRS corn farms, by enterprise size, 1991**

Item	Unit	Enterprise size (acres)				All FCRS farms
		Fewer than 50	50-199	200-399	400 or more	
Corn production practices:						
Irrigated	percent of acreage	3	6	15	29	18
Dryland	percent of acreage	97	94	85	71	82
Crop rotation on corn acres: <sup>1</sup>						
Corn-corn	percent of farms	30	25	30	33	28
Corn-soybeans	percent of farms	11	39	64	35	35
Corn-other	percent of farms	4	8	2	10	6
Soybeans-corn	percent of farms	5	2	d	d	3
Soybeans-soybeans	percent of farms	9	4	1	10	6
Soybeans-other	percent of farms	2	3	d	d	2
Other-corn	percent of farms	17	7	d	d	8
Other-soybeans	percent of farms	d	1	d	d	1
Other-other	percent of farms	22	11	2	4	12
Seed:						
Rate, total <sup>2</sup>	seeds/acre	23,339	24,570	25,758	26,271	25,537
Rate, one time	seeds/acre	23,130	24,326	25,338	26,162	25,291
Acres reseeded	percent of acres	1	1	2	d	1
Fertilizer use:						
Any fertilizer	percent of farms	94	98	100	100	98
Nitrogen	percent of farms	91	97	99	100	96
Phosphorus	percent of farms	85	89	94	85	88
Potassium	percent of farms	80	82	83	73	81
Manure	percent of farms	37	29	26	27	30
Fertilizer use:						
Nitrogen	lbs/acre	79	103	133	136	124
Phosphorus	lbs/acre	46	48	55	52	51
Potassium	lbs/acre	56	54	62	55	57
Manure	lbs/acre	2	1	1	1	1
Chemical use:						
Any chemicals	percent of farms	83	99	99	100	95
Herbicides	percent of farms	81	95	99	94	92
Insecticides	percent of farms	13	25	37	48	27
Herbicide	acre-treatments	1.10	1.37	1.40	1.33	1.35
Insecticide	acre-treatments	0.11	0.19	0.32	0.45	0.33
Tillage system use:						
Conventional	percent of farms	90	73	65	63	75
Conservation	percent of farms	10	27	35	37	25
Tillage and planting	field passes	3.90	3.27	2.96	2.86	3.34
Tillage and planting	hours/acre	1.28	0.56	0.40	0.33	0.71
Soil surface covered	percent	11	21	25	27	20
Custom operations use:						
Any custom operations	percent of farms	61	71	75	61	68
Land prep/cultivation	percent of farms	4	6	d	d	4
Planting	percent of farms	7	6	d	d	4
Fert/chem application	percent of farms	51	68	72	60	63
Harvesting	percent of farms	27	22	11	10	20
Drying use:						
Bushels dried	percent of production	25	45	56	58	53
Bushels commercially dried	percent of production	10	10	18	19	16
Bushels farm dried	percent of production	15	35	37	39	37
Moisture removed	percentage points	0.54	2.42	3.46	4.30	2.29

<sup>1</sup>Data may not sum due to rounding.

<sup>2</sup>Total seeding rate includes reseeded.

d = insufficient data for disclosure.

**Appendix table 5--Characteristics of FCRS corn farms, by region, 1991**

Item	Unit	Region				All FCRS farms
		North Central	Plains	Southeast	Northeast	
Share of FCRS:						
Corn farms	percent	70	16	8	6	100
Corn production	percent	67	27	4	2	100
Corn yield	actual bu/acre	108	128	89	61	110
Corn yield	expected bu/ac	132	132	103	127	131
Size:						
Total operated acreage	acres	441	1,351	840	408	617
Planted corn acreage	acres	162	241	93	92	165
Harvested for grain	percent of acreage	96	96	98	68	95
Harvested for forage	percent of acreage	3	3	1	32	4
Sales class <sup>1</sup> :						
\$0-\$39,999	percent of farms	27	21	52	18	28
\$40,000-\$99,999	percent of farms	29	16	21	30	27
\$100,000-\$499,999	percent of farms	31	39	13	29	31
\$500,000 or more	percent of farms	12	24	15	23	15
Corn production value	dollars	32,861	64,244	16,422	5,077	34,832
Farm production value	dollars	130,648	286,439	148,720	152,827	158,176
Corn acreage tenure: <sup>1</sup>						
Owned	percent of acreage	38	43	56	69	41
Cash-rented	percent of acreage	31	28	26	28	30
Share-rented	percent of acreage	30	29	18	d	28
Previous crop on corn acres: <sup>1</sup>						
Corn	percent of farms	33	50	41	68	38
Soybeans	percent of farms	52	19	41	5	43
Wheat	percent of farms	3	19	d	3	4
Corn program participation	percent of farms	63	84	39	36	64
Corn base	acres	137	252	84	64	151
Production specialty: <sup>1</sup>						
Cash grains	percent of farms	55	50	16	17	48
Other crops	percent of farms	1	6	37	d	5
Livestock	percent of farms	44	44	46	82	47
Livestock inventory:						
Beef cattle	percent of farms	41	69	62	51	48
Dairy cattle	percent of farms	24	6	8	73	23
Hogs	percent of farms	31	22	29	23	29
Other livestock	percent of farms	15	23	13	41	18
Corn for farm use	percent of production	23	14	24	67	21
Financial position: <sup>1</sup>						
Favorable	percent of farms	62	60	69	68	63
Marginal income	percent of farms	21	21	28	26	22
Marginal solvency	percent of farms	9	13	d	d	9
Vulnerable	percent of farms	8	6	d	d	7
Major occupation:						
Farming	percent of farms	86	96	85	98	88
Other	percent of farms	14	4	15	2	12
Operator age:						
Fewer than 50 years	percent of farms	49	49	20	64	48
50 years or more	percent of farms	51	51	80	46	52
Operator education: <sup>1</sup>						
High school or less	percent of farms	71	50	77	57	67
Completed college	percent of farms	10	28	20	18	15

<sup>1</sup>Data may not sum due to rounding or omission of possible categories.  
d = insufficient data for disclosure.

**Appendix table 6--Practices and input use of FCRS corn farms, by region, 1991**

Item	Unit	Region				All FCRS farms
		North Central	Plains	Southeast	Northeast	
Corn production practices:						
Irrigated	percent of acreage	2	68	3	0	18
Dryland	percent of acreage	98	32	97	100	82
Crop rotation on corn acres: <sup>1</sup>						
Corn-corn	percent of farms	23	42	29	54	28
Corn-soybeans	percent of farms	44	15	23	5	35
Corn-other	percent of farms	3	18	d	7	6
Soybeans-corn	percent of farms	3	d	d	0	3
Soybeans-soybeans	percent of farms	5	3	17	0	6
Soybeans-other	percent of farms	3	0	0	0	2
Other-corn	percent of farms	7	7	8	14	8
Other-soybeans	percent of farms	2	0	d	0	1
Other-other	percent of farms	10	14	15	20	12
Seed:						
Rate, total <sup>2</sup>	seeds/acre	25,428	25,818	23,844	28,276	25,537
Rate, one time	seeds/acre	25,251	25,710	23,489	25,755	25,291
Acres reseeded	percent of acres	1	d	2	d	1
Fertilizer use:						
Any fertilizer	percent of farms	99	89	96	100	97
Nitrogen	percent of farms	98	86	96	100	96
Phosphorus	percent of farms	92	69	90	97	88
Potassium	percent of farms	89	32	91	96	81
Manure	percent of farms	35	14	d	60	30
Fertilizer use:						
Nitrogen	lbs/acre	125	130	110	77	124
Phosphorus	lbs/acre	58	29	55	71	51
Potassium	lbs/acre	72	7	84	58	57
Manure	tons/acre	1	1	d	6	1
Chemical use:						
Any chemicals	percent of farms	98	86	80	100	95
Herbicides	percent of farms	96	81	76	95	92
Insecticides	percent of farms	25	41	12	22	27
Herbicide	acre-treatments	1.39	1.25	1.26	1.40	1.35
Insecticide	acre-treatments	0.20	0.74	0.18	0.23	0.33
Tillage system use:						
Conventional	percent of farms	76	65	92	74	75
Conservation	percent of farms	24	35	8	26	25
Tillage and planting	field passes	3.21	3.57	4.06	3.33	3.34
Tillage and planting	hours/acre	0.63	0.57	1.21	1.27	0.71
Soil surface covered	percent	20	25	9	16	20
Custom operations use:						
Any custom operations	percent of farms	73	59	57	51	68
Land prep/cultivation	percent of farms	5	4	d	0	4
Planting	percent of farms	5	3	d	d	4
Fert/chem application	percent of farms	69	53	46	39	63
Harvesting	percent of farms	22	15	19	19	20
Drying use:						
Bushels dried	percent of production	59	43	43	12	53
Bushels commercially dried	percent of production	14	26	2	d	16
Bushels farm dried	percent of production	46	17	42	11	37
Moisture removed	percentage points	2.88	1.05	1.09	0.25	2.29

<sup>1</sup>Data may not sum due to rounding.

<sup>2</sup>Total seeding rate includes reseeding.

d = insufficient data for disclosure.

## Appendix 2: About the Accounting System

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The accounting of costs and returns follows the Economic Research Service methods and format. The methods and format have been developed over time with input from the National Agricultural Cost of Production Standards Review Board, which was established under the Agricultural and Food Act of 1981. This format was revised in the early 1980's after reviews by commodity groups, land-grant university economists, and individual farmers (USDA, ERS, 1992).

The costs and returns presented in this report are the same as those published for 1991 in the *Economic Indicators of the Farm Sector* series published by USDA's Economic Research Service (ERS). A relatively new system to estimate commodity costs and returns, called the Farm-Level Budget Model (FLBM), was implemented for corn in 1991. The FLBM replaces a version of the Firm Enterprise Data System (FEDS) previously used to estimate costs and returns. Under the FLBM, the costs and returns are calculated for each farm, then farms are weighted to provide State, regional, and national estimates. Under the FEDS, cost and return estimates were calculated as if all production for a commodity was produced on a single average acre in the State. In contrast to FEDS, the FLBM allows for the distributional analysis presented in this report.

Three characteristics of the ERS estimates of crop costs and returns distinguish them from other cost accounting systems:

**Government programs.** ERS estimates exclude the direct effects of Government programs where possible. Thus, policymakers may be informed as to

production costs and returns in the absence of programs. Participants in an income-support program must set aside or conserve a portion of their acreage that would have been planted to a particular crop. In return, participants receive direct Government payments based on production of the crop on the remaining acreage. Participants may also be required to incur costs by maintaining a cover crop or by controlling weeds on set-aside acreage. ERS does not include either of these costs or direct payments for participating in the Government commodity-based income-support programs. For further discussion of the influence on commodity costs and returns of including the effects of Government programs, see Salassi, 1990.

**Combined operation-landlord costs and returns.**

The estimates of costs and returns are for the farm operation and landlord combined, as if they were one business. Thus, each line item is for both the farm operation and landlord. The combined operation-landlord account also means that estimates of cash expenses do not include an expense for cash- and share-rent expenses paid by the farm operation to the landlord. A rental expense to the farm business is exactly canceled as an income to the landlord.

**Separation of production and marketing costs.**

To separate the costs of production from the costs of marketing, the production costs are incurred to the point of first sale, or storage if the commodity is not sold immediately after harvest. Costs of drying and costs of hauling the crop to the elevator or processor are included. Because storage costs are excluded, the commodity is valued at its time of harvest.

## Appendix 3: Data Reliability

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Survey results are only indications of the total population. They may differ from data collected in a complete census using the same questionnaires, instructions, and enumerators. A measure of this sample variability, called sampling error, is available from survey results. Sampling errors may be expressed as a percentage of the estimate. These percentages represent the relative standard error of the estimate and are often referred to as coefficients of variation (C.V.). In general, the smaller the C.V. the greater the reliability of the estimate.

The average total variable cash cost for all farms, \$137.87 per acre, has a C.V. of 3.22 percent. The confidence interval based on a 95-percent probability for total variable cash cost per acre of producing corn in the United States is estimated to be \$131.47-\$144.27. The relative standard error of the estimate can also be used to evaluate the statistical significance of differences of means between groups. For example, the appropriate t-statistic for a comparison of total variable cash cost per acre between low- and high-cost producers can be constructed by taking the difference between the mean of the two groups (TVC) and dividing by the square root of the sum of the squared standard

errors of the two groups ( $SE^2$ ). Or:

$$t = \frac{(TVC_{\text{low-cost}} - TVC_{\text{high-cost}})}{(SE^2_{\text{low-cost}} + SE^2_{\text{high-cost}})^{0.5}}$$
$$= (96.76 - 144.86) / (15.281 + 41.929)^{0.5} = -6.359$$

Differences among means of the characteristic and cost and return items for the various groupings presented in this report were statistically tested. Although t-statistics are not reported here, the discussion in each section emphasizes comparisons among the groups only when means were significantly different at the 95-percent level.

Survey data are also influenced by nonsampling errors, which are not measurable or known. Nonsampling errors may be introduced by enumerators, respondents, and questionnaire design, among other factors. Efforts were made to minimize these errors and maintain survey accuracy, including training of data collectors, detailed review and edit of data, and analysis for comparability and consistency.

**Appendix table 7--Coefficients of variation of corn variable cash costs and returns, by cost group, 1991**

Item	Cost group			All FCRS farms
	Low-cost producers	Mid-cost producers	High-cost producers	
<i>Percent</i>				
Costs per bushel:				
Variable costs, actual yield	2.28	2.20	5.03	2.59
Variable costs, expected yield	2.21	2.96	4.45	2.43
Costs and returns per acre:				
Value of production	3.39	3.00	6.22	2.73
Total variable costs	4.04	3.81	4.47	3.22
Seed	5.18	3.00	6.90	2.44
Fertilizer	10.04	6.14	7.29	4.77
Chemicals	7.25	4.57	12.17	4.23
Custom operations	15.53	20.02	17.91	14.27
Fuel, lube, and electricity				
Machine and vehicle	3.25	3.82	4.04	2.59
Irrigation	63.34	19.99	39.10	20.76
Drying	19.33	14.32	57.72	12.40
Repairs	2.89	3.69	5.54	2.60
Hired labor	34.92	15.07	17.46	11.91
Purchased irrigation water	74.57	39.66	69.95	34.78
Technical services	37.59	19.92	94.78	21.74
Commercial drying	32.73	24.48	28.04	19.62
Returns above variable costs	3.54	3.62	449.83	4.48

**Appendix table 8--Coefficients of variation of corn variable cash costs and returns, by enterprise size, 1991**

Item	Enterprise size (acres)				All FCRS farms
	Fewer than 50	50-199	200-399	400 or more	
Percent					
Costs per bushel:					
Variable costs, actual yield	4.68	3.23	3.35	4.56	2.59
Variable costs, expected yield	3.74	2.87	3.27	4.14	2.43
Costs and returns per acre:					
Value of production	5.81	2.87	3.21	4.99	2.73
Total variable costs	3.92	2.82	3.82	5.86	3.22
Seed	5.00	2.42	3.06	4.82	2.44
Fertilizer	5.73	4.59	5.27	8.78	4.77
Chemicals	11.06	5.65	6.28	8.14	4.23
Custom operations	17.64	14.89	14.25	28.64	14.27
Fuel, lube, and electricity					
Machine and vehicle	8.88	2.92	4.26	4.68	2.59
Irrigation	77.70	31.04	44.56	23.70	20.76
Drying	46.61	12.58	15.64	20.16	12.40
Repairs	5.47	2.95	5.25	3.81	2.60
Hired labor	17.11	14.09	15.77	15.76	11.91
Purchased irrigation water	51.61	58.52	69.30	42.96	34.78
Technical services	49.77	44.34	38.44	26.81	21.74
Commercial drying	32.58	22.18	26.89	30.29	19.62
Returns above variable costs	14.83	5.86	5.53	7.81	4.48

**Appendix table 9--Coefficients of variation of corn variable cash costs and returns, by region, 1991**

Item	Region				All FCRS farms
	North Central	Plains	Southeast	Northeast	
Percent					
Costs per bushel:					
Variable costs, actual yield	3.35	4.62	8.72	11.84	2.59
Variable costs, expected yield	2.68	4.58	9.30	8.39	2.43
Costs and returns per acre:					
Value of production	2.59	5.68	5.14	9.84	2.73
Total variable costs	2.21	8.63	7.50	5.94	3.22
Seed	2.41	5.89	10.20	9.74	2.44
Fertilizer	4.87	13.41	3.47	12.40	4.77
Chemicals	4.85	9.45	24.94	24.58	4.23
Custom operations	11.41	39.31	35.70	37.67	14.27
Fuel, lube, and electricity					
Machine and vehicle	2.41	6.44	8.10	8.60	2.59
Irrigation	96.06	14.37	225.87	na	20.76
Drying	12.25	58.47	36.21	67.39	12.40
Repairs	2.78	5.20	6.42	9.25	2.60
Hired labor	15.86	23.58	24.73	26.03	11.91
Purchased irrigation water	99.00	30.05	na	na	34.78
Technical services	38.46	21.55	101.89	60.62	21.74
Commercial drying	16.81	46.92	80.05	124.25	19.62
Returns above variable costs	5.59	5.29	22.52	64.89	4.48

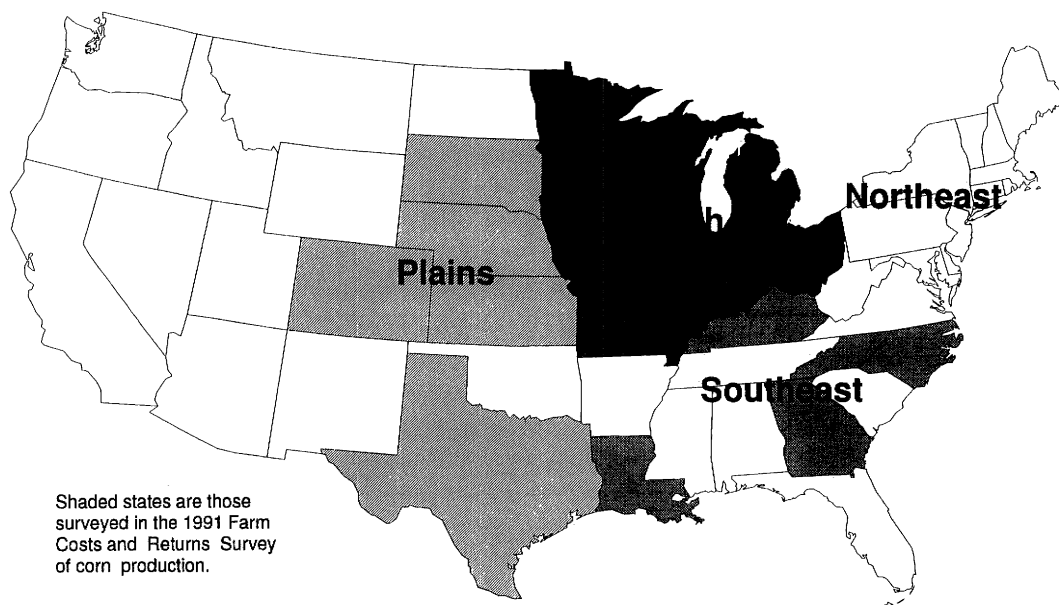
na = not applicable.

Figure 5

## Major U.S. corn production regions, 1991

*Farmers surveyed in the production regions shown accounted for about 94 percent of total U.S. corn acreage.*

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